

**REMARKS**

In the Office Action, claims 4, 8, 14, 15, 17, 18, 30-33, 36-37, 40-41 and 43 were rejected under 35 U.S.C. §112, first paragraph, and claims 4, 5, 8, 9, 13-18, 30-41 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wijarankula (US 5,961,713) in view of Graef et al. (US 5,935,320) or Tamatsuka et al. (US 6,162,708).

Please enter the above amendments in the claims. Specifically, please cancel claims 1-3, 6-7, 10-21, 23-24, 26-41 and 43 without prejudice, and please amend claims 4, 5, 22, 25 and 42. Claims 4, 5, 8, 9, 22, 25 and 42 remain in the case.

Claim rejection under 35 U.S.C. §112, first paragraph:

The Examiner has asserted that the subject matter recited in claims 4, 8, 14, 15, 17, 18, 30-33, 36-37, 40-41 and 43 is not described in the original claims, specification and drawings.

However, of those rejected claims, claims 14, 15, 17, 18, 30-33, 36-37, 40-41 and 43 are cancelled. Therefore, the rejections of these cancelled claims are now moot.

For the remaining claims 4 and 8, FIG. 4 discloses two parallel lines, which are recited in both claims 4 and 8. Therefore, the original disclosure supports the subject matter recited in claims 4 and 8.

Claim rejection under 35 U.S.C. §103:

The Examiner has asserted that claims 4, 5, 8, 9, 13-18, 30-41 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wijarankula (US 5,961,713) in view of Graef et al. (US 5,935,320) or Tamatsuka et al. (US 6,162,708).

However, of those rejected claims, the claims 13-18, 30-41 are cancelled. Therefore, the rejections of these cancelled claims are now moot.

The claims remaining in the case, claims 4 to 5, 8 to 9, 22, 25 and 42 have been rejected as unpatentable over Wijarankula in view of Graef or Tamatsuka. Applicant has amended these claims so that each now contains the concept of controlling the nitrogen concentration and oxygen concentration within the melt chamber so that it falls within the area on the graph and, thus, the oxygen and nitrogen concentration are within specified limits. Control of the oxygen and nitrogen concentration causes the nitrogen concentration to increase gradually from a shoulder portion to a tail portion and the oxygen concentration correspondingly decreases. As a result of this control, a unique silicon single crystal ingot is

produced. The prior art does not show this method of controlling the atmosphere of the melt chamber nor does it suggest such a method of control.

In addition to the above, claims 4 to 5 and 8 to 9 have been rejected as unpatentable over Graef et al. The Examiner has admitted that Graef does not teach any deliberate control of the oxygen or nitrogen concentration, but that the gradually increasing nitrogen concentration and gradually decreasing oxygen concentration is inherent. The Examiner's conclusion is faulty. The Examiner states that such features are inherent to doped crystals pulled using the Czochralski method, however relies on Applicant's disclosure to reach such a point. This is not permissible in a determination of patentability. The Examiner must point to prior art evidence in support of his patentability determination.

The Examiner has stated with regard to claim 5 that the subject claim recites overlapping ranges with Graef. However, Applicant has amended claim 5 to include the steps of controlling the nitrogen concentration and oxygen concentration to go within such a range, and accordingly, is not obvious from the teachings of Graef who only teaches the resulting product but within such overlapping ranges.

With regard to claim 8, the Examiner has rationalized that it would have been obvious to modify Graef by optimizing the oxygen concentration in relation to the nitrogen concentration by conducting routine experimentation of result-effective variables. However, there is no suggestion in Graef that the relative oxygen concentration and nitrogen concentration in the melt chamber is a result-effective variable, and accordingly, the parameter that was optimized is not recognized in the art as such. Therefore, there is no suggestion that the change of such result-effective variables can be characterized as routine experimentation. In re: Antonie 195 USPQ 6 (CCPA (1977)) see also in re: Boesch 205 USPQ 215 (CPA (1980)) and MPEP 2144.05. Therefore, Applicant believes that the above discussed claims are patentable.

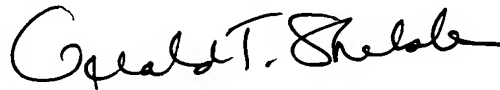
Claims 4 to 5 and 8 to 9 have also been rejected as unpatentable over Tamatsuka. The same comments with respect to Graef as set forth above apply here, and as such, Applicant believes that these claims are also, as amended, allowable.

Claims 22 and 25 have been rejected as unpatentable over Wijarankula in view of Graef or Tamatsuka and further in view of Hakomori. Insofar as claims 22 and 25 depend from claims now believed allowable, they contain all the limitations of the parent claim and, as such, should be allowable as well.

Applicant hereby requests reconsideration and reexamination thereof.

With the above amendments and remarks, this application is considered ready for allowance and Applicant earnestly solicits an early notice of same. Should the Examiner be of the opinion that a telephone conference would expedite prosecution of the subject application, he is respectfully requested to call the undersigned at the below-listed number.

Respectfully submitted,  
**WELSH & KATZ, LTD.**



Gerald T. Shekleton  
Registration No. 27,466

Dated: **April 20, 2006**  
**WELSH & KATZ, LTD.**  
120 S. Riverside Plaza,  
22<sup>nd</sup> Floor  
Chicago, IL 60606-3912  
Telephone: 312/655-1500  
Facsimile: 312/655-1501